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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/771,137	01/24/2001	Bruce A. Judson	PA000220	6736

23696 7590 05/19/2004

Qualcomm Incorporated
Patents Department
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EXAMINER	
LE, DUY K	

ART UNIT	PAPER NUMBER
2685	8

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/771,137	JUDSON, BRUCE A.	
	Examiner	Art Unit	
	Duy K Le	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to amendment filed on February 24, 2004.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-2, 4, 9-14, 16, and 21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Weaver et al. (U.S. Patent 6,421,005).

As to claim 1, the Weaver reference discloses a method comprising the steps of:

using an antenna beam pattern to send a communication signal to a user ("the beam patterns 30A-C as shown in FIG. 1 dictate the area or sector from which information can be received from wireless communication units and to which information can be sent" (Col. 1, lines 28-31));

determining a statistic using a control signal from said user ("based upon data gathered from wireless mobile units using the cylindrical antenna arrays 100, such as position and signal information (such as transmit power, for example) monitored and gathered at a remote location for example; the number of antenna components, antenna pattern, and beam configuration, beam orientation, or even dynamic down-tilting and up-titling are easily achieved by remotely controlling controller 200" (Col. 4, lines 28-35). "By providing such location or position

information along with the signal information (such as signal strength, measurements, transmit power, etc.), antenna component configuration adjustment can be made to minimize interference and call droppage and maximize coverage" (Col. 5, line 63 to Col. 6, line 1));

utilizing said statistic to narrow said antenna beam pattern relative to a position of said user ("based upon data gathered from wireless mobile units using the cylindrical antenna arrays 100, such as position and signal information (such as transmit power, for example) monitored and gathered at a remote location for example; the number of antenna components, antenna pattern, and beam configuration, beam orientation, or even dynamic down-tilting and up-titling are easily achieved by remotely controlling controller 200" (Col. 4, lines 28-35). "By providing such location or position information along with the signal information (such as signal strength, measurements, transmit power, etc.), antenna component configuration adjustment can be made to minimize interference and call droppage and maximize coverage" (Col. 5, line 63 to Col. 6, line 1). "For example, the controller 200 controls the cylindrical antenna array 100 to adjust beam configuration for example, by narrowing beam width of one antenna component of the cylindrical array 100 and widening beam width of another antenna component within the same cell" (Col. 7, lines 33-37). "Narrowing the beam width of an antenna component of a heavily loaded sector while widening the beam width of the antenna component of a lightly loaded sector, as one way of adjusting beam component configuration" (Col. 9, lines 10-15)).

As to claim 2, the Weaver reference discloses the method of claim 1 further comprising storing said antenna beam pattern after said utilizing step ("in "tuning" or reconfiguring the antenna components of the cylindrical antenna array 100, neighbor sets are developed and stored in memory 220 of controller 200" (Col. 4, lines 55-57)).

As to claims 4 and 16, the Weaver reference discloses the control signal is a power control signal ("based upon data gathered from wireless mobile units using the cylindrical antenna arrays 100, such as position and signal information (such as transmit power, for example) monitored and gathered at a remote location for example; the number of antenna components, antenna pattern, and beam configuration, beam orientation, or even dynamic down-tilting and up-titling are easily achieved by remotely controlling controller 200" (Col. 4, lines 28-35)).

As to claim 9, the Weaver reference discloses the method of claim 1 wherein said antenna beam pattern is formed using an adaptive antenna array ("cylindrical base station antenna arrays which are initially set up based upon mathematical parameters, and which can easily be adjusted or adapted in various ways so as to minimize interference and maximize coverage within a cell and between neighboring cells" (Col. 3, lines 35-39)).

As to claims 10 and 22, the Weaver reference discloses the communication signal is sent over a forward link of a wireless communication system ("the beam patterns 30A-C as shown in FIG. 1 dictate the area or sector from which information can be received from wireless communication units and to which information can be sent" (Col. 1, lines 28-31). As interpreted by examiner, forward link refers to transmission from the base station to a mobile unit. The beam patterns transmit information from the base station to a mobile unit).

As to claims 11 and 23, the Weaver reference discloses the wireless communication system is a wideband code division multiple access communication system ("to fully take advantage of the large capacity and essentially soft limit provided to wireless systems by CDMA

technology for example, the load on each of the antenna components of the cell is monitored" (Col. 7, lines 25-28)).

As to claim 12, Figure 4 in Weaver shows a system comprising:

a control signal monitoring module 200 configured to access a control signal from a user ("the controller 200 includes a central processing unit (CPU) 210, and a memory 220. The CPU 210 receives information, such as information for reconfiguring antenna components, in a wireless manner through fixed signal 230 and/or through connections to other components which receive the position and signal information from the wireless mobile units" (Col. 4, lines 42-48));

a signal statistic computation module 200 configured to determine a statistic from a sequence of monitored signals output by said signal monitoring module ("this position and signal for a given base station is preferably received and monitored in a location remote to a controller 200 of the base station. Using this information, antenna component configuration parameters for reconfiguring antenna components of a corresponding cylindrical antenna array 100 are determined" (Col. 6, lines 1-6));

an antenna beam pattern optimizing module 200 configured to utilize said statistic to narrow an antenna beam pattern relative to a position of said user ("based upon data gathered from wireless mobile units using the cylindrical antenna arrays 100, such as position and signal information (such as transmit power, for example) monitored and gathered at a remote location for example; the number of antenna components, antenna pattern, and beam configuration, beam orientation, or even dynamic down-tilting and up-titling are easily achieved by remotely controlling controller 200" (Col. 4, lines 28-35). "By providing such location or position information along with the signal information (such as signal strength, measurements, transmit

power, etc.), antenna component configuration adjustment can be made to minimize interference and call droppage and maximize coverage" (Col. 5, line 63 to Col. 6, line 1). "For example, the controller 200 controls the cylindrical antenna array 100 to adjust beam configuration for example, by narrowing beam width of one antenna component of the cylindrical array 100 and widening beam width of another antenna component within the same cell" (Col. 7, lines 33-37)).

As to claim 13, the Weaver reference discloses the system of claim 12 further comprising an adaptive antenna array module configured to output and direct said antenna beam pattern to said user ("cylindrical base station antenna arrays which are initially set up based upon mathematical parameters, and which can easily be adjusted or adapted in various ways so as to minimize interference and maximize coverage within a cell and between neighboring cells" (Col. 3, lines 35-39)).

As to claim 14, Figure 1 in Weaver discloses the system of claim 12 further comprising an antenna beam pattern storing module 220 configured to store said antenna beam pattern ("in "tuning" or reconfiguring the antenna components of the cylindrical antenna array 100, neighbor sets are developed and stored in memory 220 of controller 200" (Col. 4, lines 55-57)).

As to claim 21, the Weaver reference discloses the system of claim 12 wherein said antenna beam pattern is used to send a communication signal to said user ("the beam patterns 30A-C as shown in FIG. 1 dictate the area or sector from which information can be received from wireless communication units and to which information can be sent" (Col. 1, lines 28-31)).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,421,005 to Weaver et al. in view of Densmore et al. (U.S. Patent RE37,218).

As to claims 3 and 15, the Weaver reference discloses the method of claim 1 and the system of claim 12. However, it does not disclose the utilizing step comprises using a dithering algorithm to optimize said antenna beam pattern. The Densmore reference teaches using a dithering algorithm ("the dithering algorithm referred to above involves rocking the antenna sinusoidally in azimuth angle 1 deg in each direction at a 2 Hz rate. The satellite sends a special pilot signal for antenna tracking. By correlating the received pilot signal level sensed by the receiver with the commanded dithering of the antenna angle, the antenna controller computer determines the sign and magnitude of any pointing error" (Col. 8, lines 58-65)).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system of Weaver to have the utilizing step comprises using a dithering algorithm to optimize said antenna beam pattern, as taught by Densmore, in order to dynamically adjust the beam configuration to minimize interference.

6. Claims 6-8 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,421,005 to Weaver et al. in view of Spaling et al. (U.S. Patent Application Publication 2002/0077111 A1).

As to claims 6 and 18, the Weaver reference discloses the method of claim 1 and the system of claim 12. However, it does not disclose the statistic is an average of the control signal over a specified interval of time. The Spaling reference teaches an average of values over a specified interval of time. "An averager 202 (Figure 7) may be used optionally to average the value generated by the counter 200" (page 5, col. 2, paragraph [0046], lines 6-8). "The average is taken of values received within a certain time window" (page 5, col. 2, paragraph [0047], lines 11-12).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system of Weaver wherein the statistic is an average of the control signal over a specified interval of time, as taught by Spaling, in order to effectively smooth out any abrupt, momentary changes in values.

As to claims 7 and 19, the Weaver reference discloses the method of claim 1 and the system of claim 12. However, it does not disclose the statistic is a running average of the control signal. The Spaling reference teaches computing a running average. "A sliding averager 216 (Figure 8) may be used to average the value generated by the counter 210 using a sliding window technique" (page 5, col. 2, paragraph [0047], lines 7-9). "As the window "moves" in time, older values are discarded and newer values are observed" (page 5, col. 2, paragraph [0047], lines 12-14).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system of Weaver wherein the statistic is a running average of the control signal, as taught by Spaling, in order to effectively smooth out any abrupt, momentary changes in values.

As to claims 8 and 20, the Weaver reference discloses the method of claim 1 and the system of claim 12. However, it does not disclose the statistic is a weighted average of the control signal. The Spaling reference teaches a weighted average. "FIG. 9 illustrates another example implementation of the invention where the transmit power control commands are "weighted" to reflect the different degrees to which those commands will likely impact the cell load/congestion condition" (page 6, col. 1, paragraph [0051], lines 1-5). "The weights are multiplied by their corresponding transmit power control command, either positive or negative. The weighted commands are selectively added in the weighted TPC command processor 302 to generate a transmit power control command "up" value and a transmit power control command "down" value" (page 5, col. 1, paragraph [0052], lines 11-16).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system of Weaver wherein the statistic is a weighted average of the control signal, as taught by Spaling, in order to reflect the different degrees each control signal measurement will likely impact the overall average value.

7. Claims 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,421,005 to Weaver et al. in view of Padovani et al. (U.S. Patent 6,574,211).

As to claims 5 and 17, the Weaver reference discloses the method of claim 1 and the system of claim 12. However, it does not disclose the control signal is a data rate control signal. The Padovani reference teaches the control signal is a data rate control signal "the C/I that any given user's mobile station achieves determines the information rate that can be supported for this particular link from the base station to the user's mobile station" (Col. 3, lines 9-12). "In the exemplary embodiment, at every time slot, the mobile station transmits to the selected base

station on a dedicated data request (DRC) channel a request for transmission at the highest data rate which the measured C/I can reliably support. The selected base station transmits data, in data packets, at a data rate not exceeding the data rate received from the mobile station on the DRC channel" (Col. 4, lines 34-41).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system of Weaver wherein the control signal is a data rate control signal, as taught by Padovani, in order to communicate from the mobile station to the serving base station the optimum data rate that can be supported.

Response to Arguments

8. Applicant's arguments filed February 24, 2004 have been fully considered but they are not persuasive.

With respect to the newly amended independent claims 1 and 12, the applicant amended the claims to recite that narrowing the beam pattern is done relative to the position of the user. As cited by examiner in the Office action, the Weaver reference does teach or suggest narrowing the beam pattern is done relative to the position of the user (see Col. 4, lines 28-35, Col. 5, line 63 to Col. 6, line 1, Col. 7, lines 33-37, and Col. 9, lines 10-15).

With respect to claims 3 and 15, as cited by examiner in the Office action, the Weaver reference teaches or suggests controlling antenna array for narrowing beam width ("for example, the controller 200 controls the cylindrical antenna array 100 to adjust beam configuration for example, by narrowing beam width of one antenna component of the cylindrical array 100 and widening beam width of another antenna component within the same cell" (Col. 7, lines 33-37).

"Narrowing the beam width of an antenna component of a heavily loaded sector while widening the beam width of the antenna component of a lightly loaded sector, as one way of adjusting beam component configuration" (Col. 9, lines 10-15)). The Densmore reference teaches using a dithering algorithm for controlling antenna. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system of Weaver to have the utilizing step comprises using a dithering algorithm to control antenna and thus optimize said antenna beam pattern, as taught by Densmore, in order to dynamically adjust the beam configuration to minimize interference.

With respect to claims 6-8 and 18-20, examiner refers to what is cited by examiner in the Office action. The Spaling reference teaches statistic of averaging value, computing a running average, and generating a weighted average of a signal that can be combined with Weaver to generate statistic of a control signal.

With respect to claims 5 and 17, as cited by examiner in the Office action, the Padovani reference teaches the control signal is a data rate control signal. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system of Weaver wherein the control signal is a data rate control signal, as taught by Padovani, in order to communicate from the mobile station to the serving base station the optimum data rate that can be supported.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duy K Le whose telephone number is 703-305-5660. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F Urban can be reached on 703-305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Duy Le
May 14, 2004

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